

**ABSTRACT**

A method and type of device for performing passive voltage contrast on a silicon on insulator (SOI) device. A first portion of a substrate of the SOI device may be ground with a dimpler. A second portion of the substrate of the SOI device may be etched using tetramethylammonium hydroxide (TMAH). A third portion of the substrate of the SOI device and a portion of a box insulator of the SOI device may be etched using hydrofluoric (HF) acid. A conductive coating may be applied to the etched portions thereby forming a conductive path from the gate to the substrate if there is a breakdown in the gate oxide. Consequently, the passive voltage contrast technique may be applied to the SOI device to detect a breakdown in the gate oxide which would be illustrated by a bright area in the gate oxide region resulting from the secondary electrons produced.